prised between the distances ϱ_r and ϱ_s, we have $m_{rs} = \frac{1}{2} \varrho_r \varrho_s \times \sin(\phi_r - \phi_s)$. This being so, developing the area m_{rs} described on the plane of the orbit as a function of the radius vector and its derivatives, including the terms multiplied by the sixth powers of the times, we have to determine the ratios of the radius vectors r_2, r_3, r_4 the two equations,—

$$\frac{r_2^3}{r_3^3} = \frac{42\,m_{23} - 50\,m_{34} - 6\,m_{45} - 18\,m_{24} + 13\,m_{35} - 11\,m_{46} + 40\,m_{56} + 2\,m_{25}}{42\,m_{12} - 50\,m_{23} - 6\,m_{34} - 18\,m_{13} + 13\,m_{24} - 11\,m_{35} + 40\,m_{45} + 2\,m_{14}},$$

$$\frac{r_3^3}{r_4^3} = \frac{42\,m_{45} - 50\,m_{34} - 6\,m_{23} - 18\,m_{35} + 13\,m_{24} - 11\,m_{13} + 40\,m_{12} + 2\,m_{25}}{42\,m_{23} - 50\,m_{34} - 6\,m_{45} - 18\,m_{24} + 13\,m_{35} - 11\,m_{46} + 40\,m_{56} + 2\,m_{25}}.$$

These ratios being known, the direct calculation of the elements is quickly effected, since in fact the numerators and denominators are quantities of the third order. For this reason I thought it proper to use six positions (instead of four, which would have been sufficient) to attenuate in Herschel's curve the errors of observation, making use of a larger number of data. The memoir containing the necessary developments and other details will appear in vol. vi. of the *Atti* of the Academy of Sciences of Naples.

Occultation of Vesta, Dec. 30, 1871. By C. G. Talmage, Esq.

The occultation of *Vesta* was well seen here on the 30th Dec. The day had been very wet, but by 9·30 P.M. the sky was quite clear. *Vesta* was exceedingly bright right up to the Moon's limb.

The G.M.T. of immersion was

$$10^{\mathrm{h}} \ 44^{\mathrm{m}} \ 24^{\mathrm{s}}\cdot8$$

and of emersion

$$11^{\mathrm{h}} \ 52^{\mathrm{m}} \ 52^{\mathrm{s}}\cdot6.$$

Both exact. Power 80 on 10-inch refractor.

Note on the Variable Star S *Orionis.* By the Rev. T. W. Webb.

I have taken the earliest opportunity of reobserving the little variable star S *Orionis*, the character of whose light, suspected early in the year 1870, I was so fortunate to ascertain satisfactorily about this time twelve months ago. I find that it is now considerably smaller than on any previous occasion when I have looked for it; and as it is well situated among comparison-stars,

whose magnitude has been carefully determined by Mr. Baxen-dell, the investigation of its changes becomes an easy matter.

It may be remembered by those who have examined it, that it has a south-preceding companion, *d* of Baxendell, 11·1 mag.; and another north-preceding, *e*, 11·5 mag.; while at a greater distance we find *f*, nearly following, 11·6 mag.; *g*, north, 11·7 mag.; and two minuter points *h*, south-following, 12·5 mag.; and *k*, just beyond *e*, 12·6 mag. On the 5th instant I found that it was much fainter than its nearest neighbours *d* and *e*, and smaller than *f* and *g*, the lesser of which has 11·7 mag., but brighter than *h* and *k*, the larger of which is rated 12·5 mag.; but as it was nearer *g* than *h*, it may be estimated as a little brighter than 12 mag. Taken altogether, the observations point to a period of less than twelve months; but further examination is obviously required; and whether the star may even now have reached its *minimum* is uncertain.

Hardwick Vicarage, 12 *Dec.* 1871.

On the Identity of the Triple Star H. i. 13.
By George Hunt, Esq.

In the *Monthly Notices*, November, 1862, the late lamented Mr. Dawes wrote a paper with the above title, on a triple star in *Aquila*. The perusal of that memoir leaves, I think it will be admitted, no doubt on the mind of the reader, that Mr. Dawes has clearly shown the identity of H. i. 13 with Σ 2545; yet it has always seemed to me, that he has not sufficiently dwelt upon *one* item in Sir W. Herschel's description of his star, which appears to establish the identity beyond all question. Sir W. Herschel says, " It is the last star of a telescopic trifolium *n* following *k*, similar to that in the hand of *Aquarius*."

In the summer of 1868 I examined this region carefully with an Equatoreal of 4-inch aperture, by Simms, and soon made out Struve's three stars Nos. 2541, 2545, and 2547, but was at first much puzzled to identify Herschel's *trifolium*, until I put on a comet eye-piece magnifying twenty-seven times with a very wide field, when the beautiful trifolium was at once visible, having Struve's No. 2545 as " the last star." It occurred to me it would be interesting to map down to scale, all the stars closely north following 37 (*k*) *Aquilæ*, which could be found in Weisse's Bessel's Catalogue, and I venture to bring the result before this Society, as in some sort supplementary to Mr. Dawes' paper. In the accompanying small map, the stars are all inserted from Weisse's Catalogue, with the exception of Struve's 2545 and 2547, which are inserted from Struve's *Positiones Mediæ* (corrected for precession to 1825), and as my object is merely to show the *relative* position of the neighbouring stars, I have not applied the pre-